A

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Attorney Docket No. 64246

Hon. Commissioner of Patents
and Trademarks
Washington, D.C. 20231

Sir:

1. This is a request for filing a:

(X) Divisional Application Under 37 CFR §1.53(b)

of pending prior application no. 08/964,257 filed on November 4, 1997 for APPARATUS EQUIPPED SCANNER UNIT wherein the inventors are:

Hitoshi TERASHIMA
Kunihiko OHMI
Satoshi ISHIDA
Tomohisa SANO
Hiroshi YAMAGISHI
Taketoshi SAWADA
Yoshiki TSUCHIYAMA
Satoshi KIRITA
Hitoshi YOSHIO
Terunobu OHUE

Using the enclosed specification of 27 pages and 22 claims.

The entire disclosure of the above mentioned pending prior application, is considered to be part of the disclosure of the accompanying application and is hereby incorporated by reference therein.

2. Prior Application Information: Examiner: M. Nguyen
Group/Art Unit: 2722

3. X The filing fee is calculated below:

CLAIMS AS FILED, LESS ANY CLAIMS CANCELLED BY AMENDMENT

	FILED	EXTRA RATE	FEE
Total claims	22		
		(2 extra)	
Independant Claims	9	$18/$9	$36.00
		(6 extra)	
		$78/$39	$468.00
		Multiple Dependant Claims	

Basic Filing Fee: $ 780.00

Total Filing Fee: $1284.00

4. X The Commissioner is hereby authorized to charge any fees which may be required, or to credit any overpayment to our Deposit Account No. 13-0410.

5. X A check in the amount of $1284.00 is enclosed.

6. X Cancel claims 1-33

7. X Amend the specification by inserting before the first line the sentence:
-- This is a Divisional of application Serial No. 08/964,257 filed November 4, 1997, and the entire disclosure of this prior application is considered to be part of the disclosure of the accompanying application and is hereby incorporated by reference therein.--

8. X Formal drawings are enclosed.
[Total Sheets: 9]

9. X The prior application is assigned to PFU Limited and FUJITSU LIMITED, as recorded under Reel 9281 and Frame 0750 & 0765 . A copy of this assignment is enclosed and this assignment carries over to the present application.

10. X Oath or Declaration [Total Pages: 6]

a. __ Newly Executed (original or copy)

b. X Copy from a prior application (37 C.F.R. § 1.63(d))

11. X Any Convention priority claimed in the parent application is hereby claimed for

this application.

12. X A preliminary amendment is attached.

13. _ Small Entity status as claimed in the parent application is still proper and hereby claimed for this application. A copy of the Small Entity document from the parent application is enclosed.

14. ACCOMPANYING APPLICATION PARTS

_ English Translation Document
_ Information Disclosure Statement/PTO Form 1449
_ Copies of IDS Citations
X Return Receipt Postcard (MPEP 503)
_ Certified Copy of Priority Document
_ Request for Reconsideration
X Other Letter Re: Drawing Correction with (2) sheets

15. X CORRESPONDENCE ADDRESS BELOW:

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Name: John James McGlew Reg. No.: 31,903

Signature: _____ Date: September 29, 1999

JJM:sk
64246.2A

DATED: September 29, 1999
SCARBOROUGH STATION
SCARBOROUGH, NEW YORK 10510-0827

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McGLEW AND TUTTLE, P.C., SCARBOROUGH STATION,
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By: _____ Date: September 29, 1999

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Re: ATTORNEY DOCKET: 64246

Sir:

Attached please find the complete application papers and fees in the above-identified application which are being placed in the U.S. Mail today, September 29, 1999, as Express Mail number EL353837814US.

A copy of the Express Mail receipt is also attached.

Respectfully submitted
for Applicant(s),

By: _____
John James McGlew
Reg. No. 31,903
McGLEW AND TUTTLE, P.C.

JJM:sk
Enclosures - Complete Application Papers and Fees
- Copy of Express Mail Receipt

DATED: September 29, 1999
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BY: ______________________ DATE: September 29, 1999

64246.2

ATTORNEY DOCKET NO: 64246

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : TERASHIMA et al.
Serial No :
Filed : September 29, 1999
For : APPARATUS EQUIPPED...
Dated : September 29, 1999

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PRELIMINARY AMENDMENT

Prior to initial examination, please amend the above-identified application as follows:

IN THE CLAIMS:

Please cancel claims 1 - 33 without prejudice and replace them with the following new claims:

34. An apparatus, comprising:

a base; and

a scanner which is removably mounted on said base and includes a reading element, a motor, and a roller driven by said motor,

wherein said motor drives said roller and thereby transports a sheet in a state with said scanner mounted on said base, so that said reading element reads the sheet, and said motor drives said roller and thereby causes said scanner to travel in a case where said scanner is detached from said base for use, so that said reading element reads a sheet.

35. An apparatus according to claim 34,

wherein a surface of said scanner on which said reading element is provided faces toward said base in a case where said scanner is mounted on said base, so that a sheet transporting path is defined by a surface of said base which faces to said surface of said scanner, and said surface of said scanner.

36. An apparatus according to claim 34, wherein said base is a printer.

37. An apparatus according to claim 34, wherein a first sheet transporting path is formed substantially vertically to allow said reading element to read said sheet in a case where said scanner is mounted on said base, said base includes a second sheet transporting path extending substantially vertically, said base performing a processing for a sheet travelling along said second sheet transporting path, and said first sheet transporting path being arranged along said second sheet transporting path.

38. An apparatus according to claim 34, wherein a projecting member is provided in a manner projecting at a side of said surface for protecting said roller in a case where said scanner is detached from said base for use.

39. An apparatus, comprising:

a base; and

a scanner which is removably mounted on said base and includes a reading element and motor,

wherein, said motor causes a sheet to be transported in a case where said scanner is mounted on said base, so that said reading element reads the sheet, said motor causes said scanner to travel in a case where said scanner is detached from said base for use, so that said reading element reads the sheet.

40. An apparatus according to claim 39,

wherein a surface of said scanner on which said reading element is provided faces to said base in a case where said scanner is mounted on said base, so that a sheet transporting path is defined by a surface of said base which faces to said surface of said scanner, and said surface of said scanner.

41. An apparatus according to claim 39, wherein said base is a printer.

42. A scanner which is capable of being removably mounted on a base, said scanner comprising:

reading element;

motor; and

roller driven by said motor,

wherein said motor drives said roller and thereby transports a sheet in a case where said

scanner is mounted on said base, so that said reading element reads the sheet, and said motor drives said roller and thereby causes said scanner to travel in a case where said scanner is detached from said base for use, so that said reading element reads a sheet.

43. A scanner according to claim 42,

wherein a surface of said scanner on which said reading element is provided faces to said base in a case where said scanner is mounted on said base, so that a sheet transporting path is defined by a surface of said base which faces toward said surface of said scanner, and said surface of said scanner.

44. A scanner according to claim 43,

wherein said scanner can be attached to and detached from said base, said base being a printer.

45. A scanner according to claim 43,

wherein a projecting member is provided in a manner projecting at a side of said surface for protecting said roller in a case where said scanner is detached from said base for use.

46. A scanner which is capable of being removably mounted on a base, said scanner comprising:

reading element; and

a motor,

wherein said motor causes a sheet to be transported in a case where said scanner is mounted on said base, so that said reading element reads the sheet, and said motor causes said scanner to travel in a case where said scanner is detached from said base for use, so that said reading element reads a sheet.

47. A scanner according to claim 46,

wherein a surface of said scanner on which said reading element is provided faces to said base in a case where said scanner is mounted on said base, so that a sheet transporting path is defined by a surface of said base which faces to said surface of said scanner, and said surface of said scanner.

48. A scanner according to claim 46,

wherein said scanner can be attached to and detached from said base, said base being a printer.

49. An apparatus comprising:

a base unit including a document sheet accommodating part accommodating a plurality of document sheets; and

a scanner apparatus including a reading element and a roller, being removably mounted

on said base unit, reading by said reading element a document sheet which is delivered from said document sheet accommodating part by said roller in a case where said scanner is mounted on said base unit, and reading by said reading element said document sheet while said roller is rotated in contact with a surface of said document sheet which is read by said reading element in a case where said scanner is detached from said base unit.

50. An apparatus according to claim 49,

wherein said roller of said scanner apparatus and a document sheet reading surface of said reading element are provided at a same side of said scanner apparatus, and a surface of said scanner apparatus on which said roller and said document sheet reading surface of said reading element are provided constitutes a part of a document sheet guide guiding said document sheet delivered from said document sheet accommodating part in a case where said scanner is mounted on said base unit.

51. An apparatus according to claim 49,

wherein said roller of said scanner apparatus is a pick roller, and said apparatus has a document sheet separating member faced to said pick roller of said scanner apparatus in a case where said scanner apparatus is mounted on said base unit.

52. An apparatus, comprising:

a first unit including a motor, a roller driven by said motor and a processing unit

performing processing for a sheet; and

a second unit on which said first unit is removably mounted,

wherein said motor drives said roller and thereby transportsaid sheet in a case where said first unit is mounted on said second unit, so that said processing unit performs processing for a sheet, and said motor drives said roller and thereby causes said first unit to travel in a case where said first unit is detached from said second unit for use, so that said processing unit performs processing for a sheet.

53. An apparatus, comprising:

a first unit including a motor and a processing unit performing processing for a sheet; and

a second unit on which said first unit is removably mounted.

wherein said motor causes the sheet to be transported in a case where said first unit is mounted on said second unit, so that said processing unit performs processing for a sheet, and said motor causes said first unit to travel in a case where said first unit is detached from said base for use, so that said processing unit performs processing for a sheet.

54. A first unit which is capable of being removably mounted on a second unit, said first unit comprising:

processing unit performing processing for a sheet;

a motor; and

a roller,

wherein said motor drives said roller and thereby transport the sheet in a case where said first unit is mounted on said second unit, so that said processing unit performs processing for a sheet, and said motor drives said roller and thereby causes said first unit to travel in a case where said first unit is detached from said second unit for use, so that said processing unit performs processing for a sheet.

55. A first unit which is capable of being removably mounted on a second unit, said first unit comprising:

processing unit performing processing for a sheet; and

a motor,

wherein said motor causes said sheet to be transported in a case where said first unit is mounted on said second unit, so that said processing unit performs processing for a sheet, and said motor causes said first unit to travel in a case where said first unit is detached from said second unit for use, so that said processing unit performs processing for a sheet.

REMARKS

Claims 34 through 55 are in this application and are presented for consideration. Claims 1through 33 have been canceled. The new claims present subject matter similar to original claims 14 - 16 and 26 - 33.

Applicant respectfully traverses the rejection of original claims 14 - 16 and 26 - 33.

Tamura discloses, shown in figure 21, an electric power source for motor drive being supplied from a motor power supply 91 to a feeding means 22. The motor is provided within the feeding means 22 as shown in figure 8. As is clearly shown in Tamura, a roller 122 in figure 14 is rotated by a roller which is directly driven and rotated by the motor via a shaft. Even when other drawings are reviewed, Tamura does not provide any teaching or suggestion of a feature that an image reading device 3 includes a motor. Therefore, it is not correct that the image reading device 3 includes a motor on the basis of the description in Tamura, for example at column 7, lines 23-58. The invention of claims 26-33 provides a first roller on a side or a removable scanner apparatus, thereby imparting to the first roller of the function of a pick up roller in the case where the scanner apparatus is mounted on the base unit, and function of a guide roller for guiding the scanner apparatus on the document sheet in the case where the scanner is used in a detached state (hand held/hand use). Thus, there is no need for providing the base unit with a pick roller, thereby reducing the number of component parts and achieving a compact apparatus size. Accordingly, it is Applicant's position that the canceled claims which are to be prosecuted in a Divisional Application, clearly patentably define over the prior art.

Favorable action on the merits is respectfully requested.

Respectfully submitted
for Applicant,

By: _____
John James McGlew
Registration No. 31,903

McGLEW AND TUTTLE, P.C.

JJM:sk
64246.3

DATED: September 29, 1999
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McGLEW AND TUTTLE, P.C.
SCARBOROUGH STATION, SCARBOROUGH, NY 10510-0827

BY: _____ DATE: September 29, 1999

ATTORNEY DOCKET NO: 64246

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	TERASHIMA et al.
Serial No	:	
Filed	:	
For	:	APPARATUS EQUIPPED...
Art Unit	:	
Examiner	:	
Dated	:	September 29, 1999

Hon. Commissioner of
Patents and Trademarks
Washington, D.C. 20231

LETTER RE DRAWING CORRECTIONS

Sir:

Please approve the following drawing corrections marked in red on the attached print.

Respectfully submitted
for Applicant,

BY: _____
John James McGlew
Reg. No.: 31,903
McGLEW AND TUTTLE, P.C.

JJM:sk
64246.4
Encls. - Drawing Corrections (2 sheets)

DATED: September 29, 1999
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McGLEW AND TUTTLE, P.C., SCARBOROUGH STATION
SCARBOROUGH, NY 10510

BY: _____ DATE: September 29, 1999

APPARATUS EQUIPPED WITH REMOVABLE SCANNER UNIT

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention generally relates to an apparatus equipped removably with a scanner unit (also referred to as a scanner-equipped apparatus) in which a base apparatus or base unit such as a personal computer, a word processor or the like incorporating therein a printer unit is combined detachably with a scanner unit so that the scanner unit itself can also be used independently as a so-called handy scanner. By way of example, as a typical one of the scanner-equipped apparatus, there may be mentioned a printer/scanner combination apparatus which is composed of a printer unit and a scanner unit combined integrally and mutually detachably and which provides advantages that the space demanded for the installation of the apparatus can be reduced when compared with the space required for installing separately the printer unit and the scanner unit and that the printer/scanner combination apparatus can be manufactured at relatively low costs. Thus, the present invention is particularly concerned with a printer/scanner combination apparatus which includes a printer unit and a scanner unit combined detachably such that the scanner unit can be detached to be used as the handy scanner, to thereby enhance the utility of the scanning function while ensuring high manipulatabilty and serviceability for maintenance of the apparatus.

Description of Related Art

In recent years, in the field of data processing with the personal computer, there arises an increasing tendency of processing image, graphics and the like data, which is accompanied with rapid spreading of the scanner apparatus for fetching the image data.

In general, the personal computer system is comprised of a main body, a display unit, a keyboard, a printer, etc.. Consequently, for the installation of the

personal computer system, a considerably large space is demanded. Such being the circumstances, user who bought a scanner will often bother his or her head over the place where the scanner is to be installed. Furthermore, although the scanner is commercially available at remarkably low price at present, purchase of the scanner means not a little burden on the consumers.

Under the circumstances, there have been developed various scanner-equipped printer apparatuses in which a sensor is mounted on a carriage of the printer, wherein image reading operation is carried out by making use of the sheet feed mechanism of the printer for feeding an image document sheet (i.e., paper or the like sheet having text, a picture or graphics recorded thereon) in efforts to implement the scanner at low costs while mitigating the space demand for the installation of the scanner.

However, in the case of the conventional scanner-equipped printer apparatuses known heretofore, the sheet feeding mechanism is used in common for both the scanning function and the printing function. Consequently, it has been impossible to use both the functions at the same time. Further known is such a printer/scanner combination apparatus in which the reader unit provided for realizing the scanning function can be detached so as to be used as a so-called handy scanner. However, because the conventional reader unit includes no driving mechanism, the handy scanner can be operated only manually. In order to allow the handy scanner to operate automatically, it is required to provide a driving mechanism dedicated for the handy scanner. However, in the conventional apparatus, the driving mechanism for the handy scanner is left unused in the state in which the handy scanner is mounted on the printer unit. Thus, in the conventional printer/scanner combination apparatus, the efficiency of hardware utilization is low, which in turn means that the cost-performance of the conventional printer/scanner combination apparatus is poor.

SUMMARY OF THE INVENTION

In the light of the state of the art described above, it is an object of the present invention to provide a scanner-equipped apparatus which includes automatic sheet feeders separately for a base unit such as a printer unit or personal computer or word processor incorporating a printer unit and a scanner unit, respectively, so that the printing function and the scanning or reading function can be made use of independently and separately from each other.

Another object of the present invention is to provide a scanner-equipped apparatus which allows a scanner unit to be detached for use as a handy scanner which is capable of operating automatically with high efficiency.

In view of the above and other objects which will become apparent as the description proceeds, there is provided according to a general aspect of the present invention a scanner-equipped apparatus of such a basic structure in which a base unit such as a printer, personal computer, word processor or the like and a scanner unit are disposed substantially vertically or in upstanding posture in parallel with each other, wherein the scanner unit is removably or detachably combined with the base unit so that the scanner unit can be used as a handy scanner. A sheet transporting path (or document sheet transportation path) for the scanner is formed between confronting surfaces of the base unit and the scanner unit when they are combined each other. Besides, the sheet feeding mechanism for the scanner unit is so implemented as to be used intact as a driving mechanism for the handy scanner. Thus, the scanner-equipped apparatus according to the present invention can be realized in a simplified mechanical structure while ensuring enhanced manipulatability.

Fundamental features of the invention as well as preferred modes for carrying out the invention will be summarized below.

According to a general or basic feature of the present invention, the apparatus equipped removably with a

scanner or the scanner-equipped apparatus includes a base unit and a scanner unit which can be removably mounted on the base unit. The base unit includes at least a controller, a part of sheet transporting mechanism and a scanner mounting means for mounting detachably the scanner unit. The scanner unit includes at least a reading unit, the remaining part of the sheet transporting mechanism and an engaging means adapted for engaging the scanner mounting means for thereby securing the scanner unit onto the base unit.

In a preferred mode for carrying out the invention, the scanner unit may be so implemented as to be capable of operating as a handy scanner in the state where the scanner unit has been detached from the base unit.

In another preferred mode for carrying out the invention, the base unit may be a printer unit.

In yet another preferred mode for carrying out the invention, the base unit may be of an automatic sheet feeding type and include a first sheet transporting path extending substantially vertically, while the scanner unit may be of an automatic sheet feeding type and include a second sheet transporting path extending substantially vertically, wherein the first and second sheet transporting paths are so disposed as to extend substantially in parallel and adjacent to each other.

In a further preferred mode for carrying out the invention, the sheet transporting path or document sheet transporting path for the scanner unit may be defined by confronting surfaces of the base unit and the scanner unit in the state in which the scanner unit is mounted on the base unit.

In a yet further preferred mode for carrying out the invention, the scanner-equipped apparatus may be so arranged that a pick roller is disposed at a location upstream of the second sheet transporting path of the scanner unit as viewed in the sheet transporting direction, while feed rollers are disposed at locations downstream of the second sheet transportation path for the scanner unit as

viewed in the sheet transporting direction.

In a still further preferred mode for carrying out the invention, the pick roller may be made of a material having low hardness, wherein auxiliary rollers which are made of a material having high hardness may be disposed at sides of the pick roller, respectively, for thereby protecting the pick roller when the scanner unit is used as the handy scanner.

In yet further preferred mode for carrying out the invention, the auxiliary rollers may be disposed at locations outside of a reading region of the scanner unit.

In another preferred mode for carrying out the invention, the auxiliary rollers may be disposed in the vicinity of the pick roller, while grooves may be provided in a surface of the base unit facing in opposition to the auxiliary rollers.

In yet another preferred mode for carrying out the invention, a mark indicating a reading region may be provided at least on one of a front side portion and a rear side portion of the scanner unit, while a mark indicating a reading position may be provided on a lateral side portion of the scanner unit.

In still another preferred mode for carrying out the invention, a cable for electrically coupling the scanner unit to the base unit may be led out from a location positioned at a lateral surface of the scanner unit.

In a further preferred mode for carrying out the invention, a cable for electrically coupling the base unit to the scanner unit may be led out from a location positioned at a lower portion of a lateral surface of the base unit.

In a yet further preferred mode for carrying out the invention, the sheet transporting mechanism for the scanner unit may include feed rollers and a driving motor for driving the feed rollers so that the scanner unit can operate as a handy scanner of an automatically running type by using the feed rollers.

In a still further preferred mode for carrying out

the invention, the base unit may include a printer unit, wherein a sheet transporting mechanism of the printer unit is comprised of a feed roller and a driving motor for driving the feed roller. Further, a sheet transporting mechanism for the scanner unit may be comprised of a sheet transporting roller and an encoder for detecting an amount of rotation of the sheet transporting roller so that the scanner unit can be operated as a manual type handy scanner.

In another preferred mode for carrying out the invention, either one of engaging portions of the base unit and the scanner unit may be constituted by a pivotal shaft for allowing the scanner unit to rotate or swing frontwards, while the other engaging portion may be implemented as a groove or alternatively as a recess for receiving and holding snugly the pivotal shaft.

In yet another preferred mode for carrying out the invention, the scanner-equipped apparatus may further include a lock means including a claw and a projecting member adapted to engage with the claw for thereby locking the scanner unit in the state mounted on the base unit.

In still another preferred mode for carrying out the invention, the scanner-equipped apparatus mentioned above may further be so arranged as to include a rotation limiting stopper means for preventing the scanner unit from swinging excessively frontwards upon detachment of the scanner unit from the base unit.

In still another preferred mode for carrying out the invention, the scanner-equipped apparatus may additionally be so arranged as to include a deviation preventing stopper means for preventing the scanner unit from displacing upwardly in the state in which the scanner unit is mounted on the base unit.

In still another preferred mode for carrying out the invention, the scanner-equipped apparatus described above may be so arranged as to include a sheet feeding means formed in a wedge-like shape as viewed in a vertical section by a pair of sheet guides disposed in opposition to each other so

that a space defined between the pair of sheet guides becomes gradually narrower toward a sheet withdrawal port, and an offset means provided for at least one of the paired sheet guides for limiting stepwise the moving of the sheet toward the sheets withdrawal port.

The above and other objects, features and attendant advantages of the present invention will more easily be understood by reading the following description of the preferred embodiments thereof taken, only by way of example, in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

In the course of the description which follows, reference is made to the drawings, in which:

Figs. 1A and 1B are views showing generally an outer appearance of a printer/scanner combination apparatus according to an embodiment of the present invention, wherein Fig. 1A shows the same in a state in which a reader unit is combined with a printer unit so as to be capable of operating as an automatic paper feed type scanner unit, and Fig. 1B shows the reader unit dismounted from the printer unit so that the reader unit can be used as a handy scanner on a guide plate;

Fig. 2 is a schematic sectional view of a scanner unit showing a document sheet feeding mechanism for the reader unit;

Fig. 3 is a developed view showing a mount/ detachment mechanism for the reader unit;

Fig. 4 is a bottom plan view of the reader unit;

Fig. 5 is a top plan view of the reader unit;

Fig. 6 is a perspective view showing the reader unit;

Fig. 7 is a sectional view showing schematically an optical mechanism incorporated in the reader unit;

Fig. 8 is a schematic sectional view showing two kinds of sheet transportation paths are provided separately; and

Fig. 9 is a schematic suctional view of a document sheet feeding tray in a printer/scanner combination apparatus according to an embodiment of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Now, the present invention will be described in detail in conjunction with what is presently considered as preferred or typical embodiments thereof by reference to the drawings. In the following description, like reference characters designate like or corresponding parts throughout the several views. Also in the following description, it is to be understood that such terms as "left", "right", "top", "bottom", "front", "rear", "lateral", "vertical", "clockwise", "counterclockwise" and the like are words of convenience and are not to be construed as limiting terms. Further, definition of terms used herein will be made. With the phrase "paper sheet", it is contemplated to encompass a blank sheet of paper and forms such as letterhead, labels, envelopes, etc. on which texts, graphics, pictures are to be printed. On the other hand, with the phrase "document sheet", it is intended to encompass such sheets or papers on which text, graphics, picture, etc, are visibly recorded. Of course, photograph and the like are equally covered by the phrase "document sheet".

Figures 1A and 1B are views showing generally an outer appearance of a printer/scanner combination apparatus according to an embodiment of the present invention, wherein Fig. 1A shows the same in the state in which a reader unit 1 is combined with a printer unit 3 so as to be capable of operating as an automatic paper feed type scanner unit, and Fig. 1B shows the same in the state in which the reader unit 1 is dismounted from the printer unit 3 so that the reader unit 1 can be used as a handy scanner on a guide plate 2.

In Fig. 1A, major portions of a mechanical structure of the printer unit 3 are located at the back side of the printer/scanner combination apparatus and thus they are invisible in this figure. The printer unit of the

printer/scanner combination apparatus shown in Fig. 1A is implemented in a vertical standing structure, wherein a paper sheet is discharged through a printed paper delivery port 5 after having been printed by a printing means (not shown). The reader unit 1 is equipped with a pick roller, a reading window and feed rollers etc., at a rear surface (which forms a bottom surface when the reader unit 1 is used as the handy scanner). The scanner unit is implemented also in a substantially upstanding structure, wherein a document sheet fed from a document sheet feeding tray 6 is discharged from a scanned document sheet delivery port 7 after data (image data) on the document sheet have been read out by the reader unit 1. Parenthetically, an L-shaped auxiliary guide 6a is provided in association with the document sheet feeding tray 6 for the purpose of supporting a pile of document sheets of large sizes. The L-shaped auxiliary guide 6a may be so implemented as to be capable of supporting the document sheets of various sizes with a simplified structure.

Referring to Fig. 1B, in the state where the reader unit 1 is detached from the printer unit to be used as the handy scanner, as shown in the figure, the reader unit 1 is electrically coupled to the printer unit 3 by means of a cable (not shown) through which power supply as well as transmission of control signals and data can be realized between the reader unit 1 and the printer unit 3. The guide plate 2 is formed of a transparent material such as acrylic resin or the like and ordinarily adapted to be disposed on a document sheet. The reader unit 1 is so dimensioned as to be snugly fit within a guide frame of the guide plate 2. By moving slideably the reader unit 1 manually or automatically over the guide plate 2, a document sheet disposed beneath the guide plate is scanned, whereby the corresponding image data is read by the reader unit 1. A reading position mark 1a is indicated at a lateral side of the reader unit 1, while reading area marks 1b are provided at the front and rear sides, respectively. These marks serve to aid the user in positioning the reader unit 1 within the reading region of

the document sheet with accuracy in particular when the original reading operation is to be carried out without resorting to the use of the guide plate.

Figure 2 is a schematic sectional view of the scanner unit showing a document sheet feeding mechanism of the reader unit 1. A document sheet transportation path for the scanner unit is formed between the printer unit and the reader unit 1 when the reader unit 1 is mounted on the printer unit. The reader unit 1 is equipped with a pick roller 10 and a feed roller 11 which are rotationally driven by a driving motor 8 through the medium of a driving gear train generally denoted by reference numeral 9. From a layer or pile of loose document sheets 12 placed on the document sheet feeding tray 6, a document sheet is withdrawn downwardly on a sheet-by-sheet basis through cooperation of the pick roller 10 and the document sheet separating member 13. The document sheet as withdrawn from the pile 12 is detected by a document sheet detection sensor 14 for making preparation for the data reading operation, which is followed by detection of the leading edge of the document sheet by a leading/trailing edge detecting sensor 15, whereupon image data reading operation is started. Subsequently, upon detection of the trailing edge of the document sheet, the image data reading operation is terminated. The feed roller 11 and a follower roller 16 cooperate to feed the scanned document sheet to a scanned document sheet delivery guide 17. In this conjunction, it should be mentioned that the scanned document sheet delivery guide 17 may be so implemented as to serve also as a cover for the printed paper delivery port 5 of the printer unit 3 shown in Fig. 1A.

Figure 3 is a developed view showing a mount/removal mechanism for the reader unit to be used also as the handy scanner. As will hereinafter be described in detail by reference to Figs. 4 and 6, the reader unit 1 is provided with a pivotal shaft receiving groove 18a, a locking claw receiving groove 20a and a stopper groove 21a, respectively, so that the reader unit 1 can be mounted

removably on the printer unit at both sides of the reader unit 1 with high security. Correspondingly, the printer unit 3 is provided with a pivotal shaft 18b, a locking claw 20b and a stopper 21b which are adapted to engage with the pivotal shaft receiving groove 18a, the locking claw 20b and the stopper groove 21a of the reader unit, respectively.

The pivotal shaft receiving groove 18a has a bottom opened. Thus, the reader unit 1 can easily be dismounted from the printer unit 3 by rotating or turning the reader unit 1 in the counterclockwise direction, as indicated by an arrow ① , from the mounted state in which the reader unit 1 is inclined in the right-hand direction (indicated by a solid line) to a substantially vertical state (indicated by broken line) and then lifting upwardly the reader unit 1, as indicated by an arrow ② . Needless to say, the reader unit 1 can be mounted by carrying out the procedures indicated by the arrows ① and ② in the reverse order. In the state where the reader unit 1 is mounted on the printer unit 3, the reader unit 1 is prevented from the counterclockwise rotation so long as a force of predetermined magnitude is not applied because of the engagement between the locking claw receiving groove 20a and the locking claw 20b. Besides, in addition to the prevention of the counterclockwise rotation of the reader unit 1, upward move of the reader unit 1 in the mounted state is prevented owing to the mutual engagement of the stopper groove 21a and the stopper 21b. In this manner, the reader unit 1 can be mounted on the printer unit 3 with significantly high security. Moreover, since the rotation stopper 19a is formed integrally with the pivotal shaft receiving groove 18a of the reader unit 1 and extends downwardly, the rotation of the reader unit 1 can be limited to within a predetermined angular range because the rotation stopper 19a is received by the rotation stopper receiving groove 19b provided in association with the printer unit 3 upon counterclockwise rotation of the reader unit 1. In this manner, the reader unit 1 can positively be protected against accidental removal from the printer unit 3 due to inadvertent

manipulation of the user.

Figure 4 is a bottom plan view showing the reader unit 1, Fig. 5 is a top plan view showing the same, and Fig. 6 is a perspective view thereof. As can be seen in Fig. 4, a pick roller 22 may be mounted on the bottom surface of the reader unit 1 at a front and center location, while a pair of feed rollers 23 are mounted at right and left positions, respectively, symmetrically relative to the rear center of the reading window 24. As can be seen in Fig. 5, each of the pick roller 22 and the feed rollers 23 is driven rotationally by the driving motor 8 by way of the driving gear train 9. Thus, when the reader unit 1 is used as the handy scanner, operation of the scanner can be performed automatically by making use of the rotational driving force or torque generated by the electric motor mentioned above. At this juncture, it should be mentioned that the pick roller 22 is usually made of a relatively flexible material of low hardness such as urethane resin. In that case, such situation may occur that the pick roller 22 is collapsed under the gravity of the reader unit and can not support the reader unit. In order to avoid such situation as mentioned above, there is provided an auxiliary rollers 22a made of a material of high hardness which serves for supporting the reader unit 1 so that the pick roller 22 does not apply excessive pressure onto the guide plate or the top surface of the document sheet. The auxiliary rollers 22a are disposed outside of the reading region 24 in order to protect the surface of the document sheet 12 against injury, as can be seen in Fig. 4. In this conjunction, it should be mentioned that the width of the auxiliary rollers 22a may be increased and mounted in the vicinity of the pick roller 22 so that the auxiliary rollers 22a can rotate freely coaxially with the pick roller 22.

Figure 7 is a sectional view showing an optical mechanism 25 incorporated in the reader unit 1. The reading position is defined at the reading window 24 described hereinbefore by reference to Fig. 4. Light rays reflected

from the document sheet to be read out and impinging into the optical mechanism through the reading window 24 reflections a number of times at a plurality of mirrors 25a to be collected by a lens 25b and received by a charge coupled device 25c which serves for converting the optical information into an electric signal.

At this juncture, it should be mentioned that the printer unit and the scanner unit of the printer/scanner combination apparatus according to the instant embodiment of the invention have sheet transportation paths (i.e., the paper sheet transportation path and the document sheet transportation path) provided separately for the printer unit and the scanner unit, respectively. Ordinarily, the printer unit is in the state where a pile of paper sheets is set or placed on the paper sheet feeding tray, while for the scanner unit, various kinds of the document sheets to be scanned or read out are set or placed on the document sheet feeding tray 6 every time the reading operation is desired. In this conjunction, if a transportation path is provided in common to the paper sheet and the document sheet for the printer unit and the scanner unit, as mentioned hereinbefore, troublesome work will be required for exchanging the paper sheets and the document sheets, incurring possibility of the paper sheets and the document sheet being erroneously mixed together. Accordingly, in the case of the printer/scanner combination apparatus according to the instant embodiment of the invention, the paper sheet transportation path and the document sheet transportation path are provided separately for the printer unit and the scanner unit, respectively. Furthermore, it is desirable that the document sheets can be placed at the document sheet feeding tray 6 more easily when compared with the setting of blank paper sheets. To this end, the document sheet transportation path for the scanner unit should be disposed at a position near to the front side of the apparatus, as viewed in Fig. 1A.

Figure 8 is a schematic sectional view of the printer/scanner combination apparatus in which the two sheet

transportation paths (i.e., the paper sheet transportation path and the document sheet transportation path) are provided separately, as mentioned above. In the printer unit 3, the paper sheet placed as a pile at the paper sheet feeding tray 4 for the printer is automatically transported on a sheet-by-sheet basis along the paper sheet transportation path 30 as indicated by an arrow. After having been printed by a printing head 28, the printed paper sheet is discharged from the printed paper delivery port 5. On the other hand, in the scanner unit portion having the reading window 24 mounted on the printer unit, the document sheet placed on the document sheet feeding tray 6 is automatically fed into the reader unit 1 on a sheet-by-sheet basis. The document sheet undergone the reading operation is transported along the document sheet transportation path 31 as indicated by an arrow to be discharged from the document sheet withdrawal port 35.

As can be seen in Fig. 8, the sheet transportation paths for the printer unit and the scanner unit are provided substantially in parallel with each other.

Since the printer unit and the scanner unit of the printer/scanner combination apparatus according to the instant embodiment of the invention are combined together and disposed at rear and front sides (as viewed in Fig. 1) or at left and right sides, respectively, as viewed in Fig. 8, the document sheet feeding tray 6 disposed at the front side (right-hand side as viewed in Fig. 8) may present an obstacle to the setting or positioning of a pile of paper sheets on the paper sheet feeding tray 4 for the printer. To cope with this problem, the document sheet feeding tray 6 should preferably be so implemented as to be pivotally inclined to the front side, as viewed in Fig. 1 (or to the right-hand side, as viewed in Fig. 8) within a predetermined angular range. It should also be noted that the printer cover/document sheet guide means 29 serves not only as the cover for the printing mechanism of the printer unit but also as the guide for the document sheet which has undergone the

reading operation by the scanner unit. Consequently, the printer cover/document sheet guide means 29 should preferably be so implemented that it can be inclined toward the front side or removed in order to facilitate the maintenance of the printing mechanism.

Figure 9 is a schematic suctional view of the document sheet feeding tray in the printer/scanner combination apparatus according to the instant embodiment of the invention. Referring to the figure, a document sheet guide 32 and an auxiliary document sheet guide member 33 are disposed in opposition to each other in such orientation that the space defined between the document sheet guide 32 and the auxiliary document sheet guide member 33 becomes narrower gradually toward a document sheet withdrawal port 35. To say in another way, the vertical section of the space between the document sheet guide 32 and the auxiliary document sheet guide member 33 presents substantially a wedge-like shape. By virtue of such arrangement, the document sheet is fed automatically into the printer/scanner combination apparatus essentially on a sheet-by-sheet even when a pile of document sheets is placed on the document sheet feeding tray 6. However, when the number of the document sheets contained in the pile is excessively large, there may take place jamming of the document sheets at or in the vicinity of the document sheet withdrawal port 35 under the weight of the document sheets as piled. To evade this problem, the document sheet guide 32 should preferably be provided with an offset portion 34 in order to prevent the load of all the document sheets piled from being concentrated to the document sheet withdrawal port 35. In this conjunction, it should be noted that a plurality of such offset portions 34 may be provided although only one offset portion 34 is shown in Fig. 9. Additionally, such offset portion may be provided in the auxiliary document sheet guide member 33 as well. Parenthetically, the offset portion is imparted with a lenient inclination so that the document sheet can slidably move downwardly to the document sheet withdrawal port 35.

Many features and advantages of the present invention are apparent from the detailed description and thus it is intended by the appended claims to cover all such features and advantages of the system which fall within the true spirit and scope of the invention. Further, since numerous modifications and combinations will readily occur to those skilled in the art, it is not intended to limit the invention to the exact construction and operation illustrated and described.

By way of example, in the printer/scanner combination apparatus described above, the driving motor 8 and the feed rollers 11 are incorporated in the reader unit 1 so that the reader unit 1 can be operated independently. However, the present invention is never restricted to the implementation of the reader unit 1 in the form of the handy scanner which can be operated automatically. Furthermore, the driving mechanism may be incorporated in the base unit (printer unit) with the reader unit 1 being constituted by the following roller and the position detecting encoder. In that case, the reader unit can be implemented in a miniaturized structure of light weight. When the handy scanner is manipulated on the guide plate, the cable is likely to provide an obstacle to the manipulation or operation of the handy scanner. Accordingly, the cable interconnecting the reader unit 1 and the printer unit 3 may preferably be secured to lower side portions of the reader unit 1 and the printer unit 3, respectively, while a cable clamp member for securing the cable to the guide plate may be provided in association with the latter.

Accordingly, all suitable modifications and equivalents may be resorted to, falling within the spirit and scope of the invention.

As will now be apparent from the foregoing description, it is possible to combine the scanner unit with a base unit such as a printer unit, personal computer, word processor or the like incorporating a printer unit so that the printer unit and the scanner unit can be operated

independent of each other. Thus, the space required for installing the base unit and the scanner unit can be reduced significantly. Besides, the scanner unit can be easily detached or removed from the base unit and used as an automatically or manually operated handy scanner essentially without need for provision of any additional means. Thus, the utility efficiency of the printer/scanner combination apparatus can be enhanced remarkably as a whole nevertheless of low manufacturing cost.

WHAT IS CLAIMED IS:

1. An apparatus equipped with a scanner, comprising:

a base unit; and

a scanner unit which can be removably mounted on said base unit,

wherein said base unit includes at least a part of sheet transporting mechanism and scanner mounting means for mounting detachably said scanner unit, and

wherein said scanner unit includes at least reading means, other part of said sheet transporting mechanism, and engaging means adapted for engaging said scanner mounting means for thereby securing said scanner unit onto said base unit.

2. An apparatus equipped with a scanner according to claim 1,

wherein said scanner unit is so implemented as to be capable of operating as a handy scanner in the state where said scanner unit has been detached from said base unit.

3. An apparatus equipped with a scanner according to claim 1,

wherein said base unit includes a printer unit.

4. An apparatus equipped with a scanner according to claim 2,

said base unit being of an automatic sheet feeding type and including a first sheet transporting path extending substantially vertically, while said scanner unit is of an automatic sheet feeding type and includes a second sheet transporting path extending substantially vertically,

wherein said first and second sheet transporting paths extend substantially in parallel and adjacent to each other.

5. An apparatus equipped with a scanner according to

claim 3,

said base unit being of an automatic sheet feeding type and including a first sheet transporting path extending substantially vertically, while said scanner unit is of an automatic sheet feeding type and includes a second sheet transporting path extending substantially vertically,

wherein said first and second sheet transporting paths extend substantially in parallel and adjacent to each other.

6. An apparatus equipped with a scanner according to claim 4,

wherein said second sheet transporting path for said scanner unit is defined by confronting surfaces of said base unit and said scanner unit in the state in which said scanner unit is mounted on said base unit.

7. An apparatus equipped with a scanner according to claim 6,

further including a pick roller disposed at a location upstream of said second sheet transporting path of said scanner unit as viewed in a sheet transporting direction, and feed rollers disposed at locations downstream of said second sheet transportation path for said scanner unit as viewed in the sheet transporting direction.

8. An apparatus equipped with a scanner according to claim 7,

wherein said pick roller is made of a material having low hardness,

said scanner unit including auxiliary rollers which are made of a material having high hardness and disposed at sides of said pick roller, respectively, for the purpose of protecting said pick roller when said scanner unit is used as the handy scanner.

9. An apparatus equipped with a scanner according to claim 8,

wherein said auxiliary rollers are disposed at locations outside of a reading region of said scanner unit.

10. An apparatus equipped with a scanner according to claim 8,

wherein said auxiliary rollers are disposed in the vicinity of said pick roller, and

wherein grooves are provided in a surface of said base unit facing in opposition to said auxiliary rollers.

11. An apparatus equipped with a scanner according to claim 2,

wherein a mark indicating a reading region is provided at least on one of a front side portion and a rear side portion of said scanner unit, and

wherein a mark indicating a reading position is provided on a lateral side portion of said scanner unit.

12. An apparatus equipped with a scanner according to claim 2,

wherein a cable for electrically coupling said scanner unit to said base unit is led out from a location positioned at a lateral surface of said scanner unit.

13. An apparatus equipped with a scanner according to claim 2,

wherein a cable for electrically coupling said base unit to said scanner unit is led out from a location positioned at a lower portion of a lateral surface of said base unit.

14. An apparatus equipped with a scanner according to claim 1,

wherein the sheet transporting mechanism for said scanner unit includes at least a feed roller so that said scanner unit can

operate as a handy scanner of a running type by using said feed roller.

15 An apparatus equipped with a scanner according to claim 1, wherein the sheet transporting mechanism for said scanner unit includes a driving motor so that said scanner unit can operate as a handy scanner of an automatically running type by using said driving motor.

16. An apparatus equipped with a scanner according to claim 1,

wherein the sheet transporting mechanism for said scanner unit includes feed rollers and a driving motor for driving said feed rollers so that said scanner unit can operate as a handy scanner of an automatically running type by using said feed rollers.

17. An apparatus equipped with a scanner according to claim 2,

wherein the sheet transporting mechanism for said scanner unit includes feed rollers and a driving motor for driving said feed rollers so that said scanner unit can operate as a handy scanner of an automatically running type by using said feed rollers.

18. An apparatus equipped with a scanner according to claim 1,

said base unit including a printer unit,

wherein a sheet transporting mechanism of said printer unit includes a feed roller and a driving motor for driving said feed roller, and

wherein a sheet transporting mechanism for said scanner unit includes a sheet transporting roller and an encoder for detecting an amount of rotation of said sheet transporting roller so that said scanner unit can be operated as a manual type handy scanner.

19. An apparatus equipped with a scanner according to claim 1,

wherein either one of engaging portions of said base unit and said scanner unit is constituted by a pivotal shaft for allowing said scanner unit to rotate frontwards, while the other engaging portion is implemented as a groove or alternatively as a recess for receiving and holding snugly said pivotal shaft.

20. An apparatus equipped with a scanner according to claim 2,

wherein either one of engaging portions of said base unit and said scanner unit is constituted by a pivotal shaft for allowing said scanner unit to rotate frontwards, while the other engaging portion is implemented as a groove or alternatively as a recess for receiving and holding snugly said pivotal shaft.

21. An apparatus equipped with a scanner according to claim 19,

further comprising:

lock means including a claw and a projecting member adapted to engage said claw for thereby locking said scanner unit in the state mounted on said base unit.

22. An apparatus equipped with a scanner according to claim 19,

further comprising:

rotation limiting stopper means for preventing said scanner unit from swinging excessively frontwards upon detachment of said scanner unit from said base unit.

23. An apparatus equipped with a scanner according to claim 19,

further comprising:

deviation preventing stopper means for preventing said scanner unit from displacing upwardly in the state in which said scanner unit is mounted on said base unit.

24. An apparatus equipped with a scanner according to claim 1,

further comprising:

sheet feeding means formed in a wedge-like shape as viewed in a vertical section by a pair of sheet guides disposed in opposition to each other so that a space defined between said pair of sheet guides becomes gradually narrower toward a sheet withdrawal port; and

offset means provided for at least one of said paired sheet guides for limiting stepwise moving of the sheet toward said sheet withdrawal port.

25. An apparatus equipped with a scanner according to claim 2,

further comprising:

sheet feeding means formed in a wedge-like shape as viewed in a vertical section by a pair of sheet guides disposed in opposition to each other so that a space defined between said pair of sheet guides becomes gradually narrower toward a sheet withdrawal port; and

offset means provided for at least one of said paired sheet guides for limiting stepwise moving of the sheet toward said sheet withdrawal port.

26 An apparatus equipped with a scanner, comprising:

a base unit; and

a scanner unit which can be removably mounted on said base unit,

wherein said base unit includes at least a part of sheet transporting mechanism and scanner mounting means for mounting detachably said scanner unit, and

wherein said scanner unit includes at least reading

means, engaging portion for engaging said scanner mounting means for there by securing said scanner unit onto said basic unit and driving motor which is used for said sheet transporting mechanism when said scanner unit mounts on said base unit, and said driving motor is further used for running said scanner unit when said scanner unit is further used for running said scanner unit when said scanner unit is detached from said base unit and operas as a handy scanner.

27. An apparatus equipped with a scanner according to claim 26,

wherein said base unit includes a printer unit.

28. An apparatus equipped with a scanner according to claim 27,

said base unit being of an automatic sheet feeding type and including a first sheet transporting path extending substantially vertically, while said scanner unit is of an automatic sheet feeding type and includes a second sheet transporting path extending substantially vertically,

wherein said first and second sheet transporting paths extend substantially in parallel and adjacent to each other.

29. An apparatus equipped with a scanner according to claim 26,

said base unit being of an automatic sheet feeding type and including a first sheet transporting path extending substantially vertically, while said scanner unit is of an automatic sheet feeding type and includes a second sheet transporting path extending substantially vertically,

wherein said first and second sheet transporting paths extend substantially in parallel and adjacent to each other.

wherein said second sheet transporting path for said scanner unit is defined by confronting surfaces of said base unit and said scanner unit in the state in which said scanner

unit is mounted on said base unit.

30. An apparatus equipped with a scanner according to claim 26,

wherein a cable for electrically coupling said base unit to said scanner unit is led out from a location positioned at a lower portion of a lateral surface of said base unit.

31. An apparatus equipped with a scanner according to claim 26,

wherein the sheet transporting mechanism for said scanner unit includes feed rollers and a driving motor for driving said feed rollers so that said scanner unit can operate as a handy scanner of an automatically running type by using said feed rollers.

32. An apparatus equipped with a scanner according to claim 26,

said base unit including a printer unit,

wherein a sheet transporting mechanism of said printer unit includes a feed roller and a driving motor for driving said feed roller, and

wherein a sheet transporting mechanism for said scanner unit includes a sheet transporting roller and an encoder for detecting an amount of rotation of said sheet transporting roller so that said scanner unit can be operated as a manual type handy scanner.

33. An apparatus equipped with a scanner according to claim 26,

wherein either one of engaging portions of said base unit and said scanner unit is constituted by a pivotal shaft for allowing said scanner unit to rotate frontwards, while the other engaging portion is implemented as a groove or alternatively as a recess for receiving and holding snugly said

pivotal shaft.

ABSTRACT OF THE DISCLOSURE

A scanner-equipped apparatus includes a combination of a base unit such as a printer unit, personal computer or word processor incorporating a printer unit and a scanner unit. The printer unit and the scanner unit can operate as automatic sheet feeder type apparatus, respectively. The scanner unit can be used as a handy scanner in the state detached from the base unit. The basic unit and the scanner unit are disposed substantially in upstanding posture in parallel with each other, wherein the scanner unit is removably combined with the base unit so that the scanner unit can be used as the handy scanner. A sheet transporting path for the scanner is formed between confronting surfaces of the base unit and the scanner unit. The sheet feeding mechanism for the scanner unit is so implemented as to be used intact as a driving mechanism for the handy scanner. The scanner-equipped apparatus can be realized inexpensively in a simplified mechanical structure while ensuring enhanced manipulatability.

FIG. 1

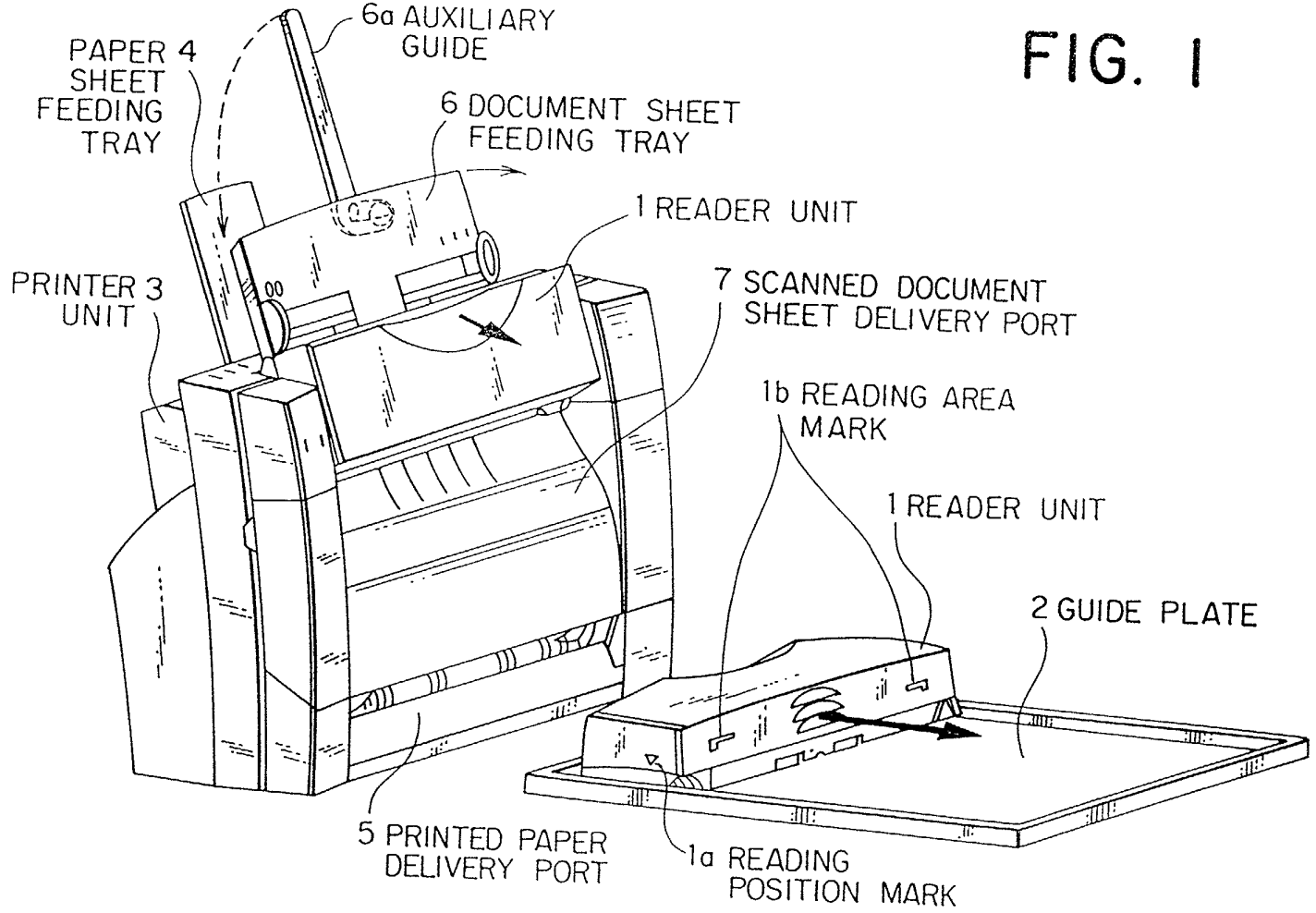

6a AUXILIARY GUIDE
PAPER 4 SHEET FEEDING TRAY
6 DOCUMENT SHEET FEEDING TRAY
1 READER UNIT
PRINTER 3 UNIT
7 SCANNED DOCUMENT SHEET DELIVERY PORT
1b READING AREA MARK
1 READER UNIT
2 GUIDE PLATE
5 PRINTED PAPER DELIVERY PORT
1a READING POSITION MARK

FIG. 1

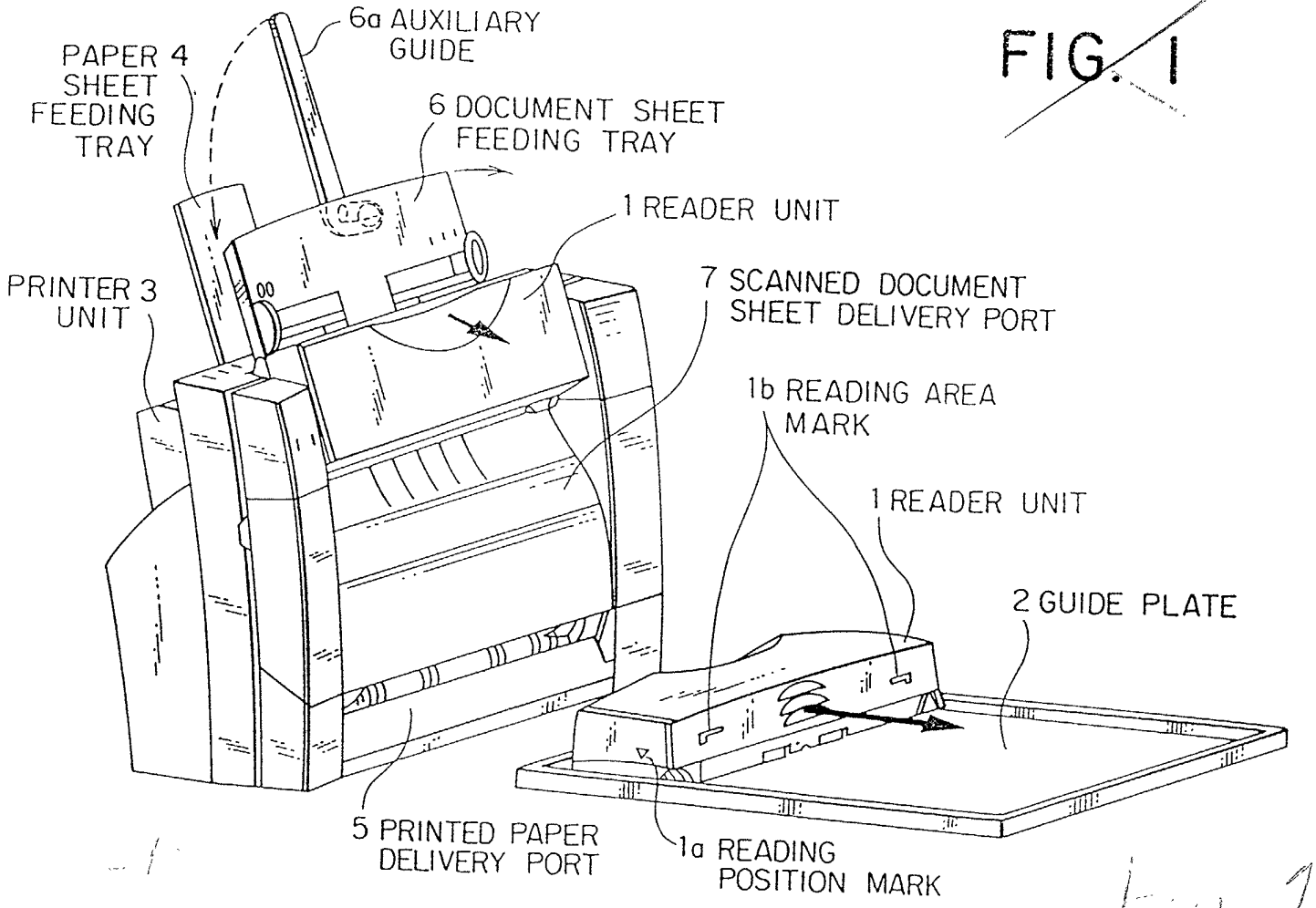


Fig. 1

FIG. 2

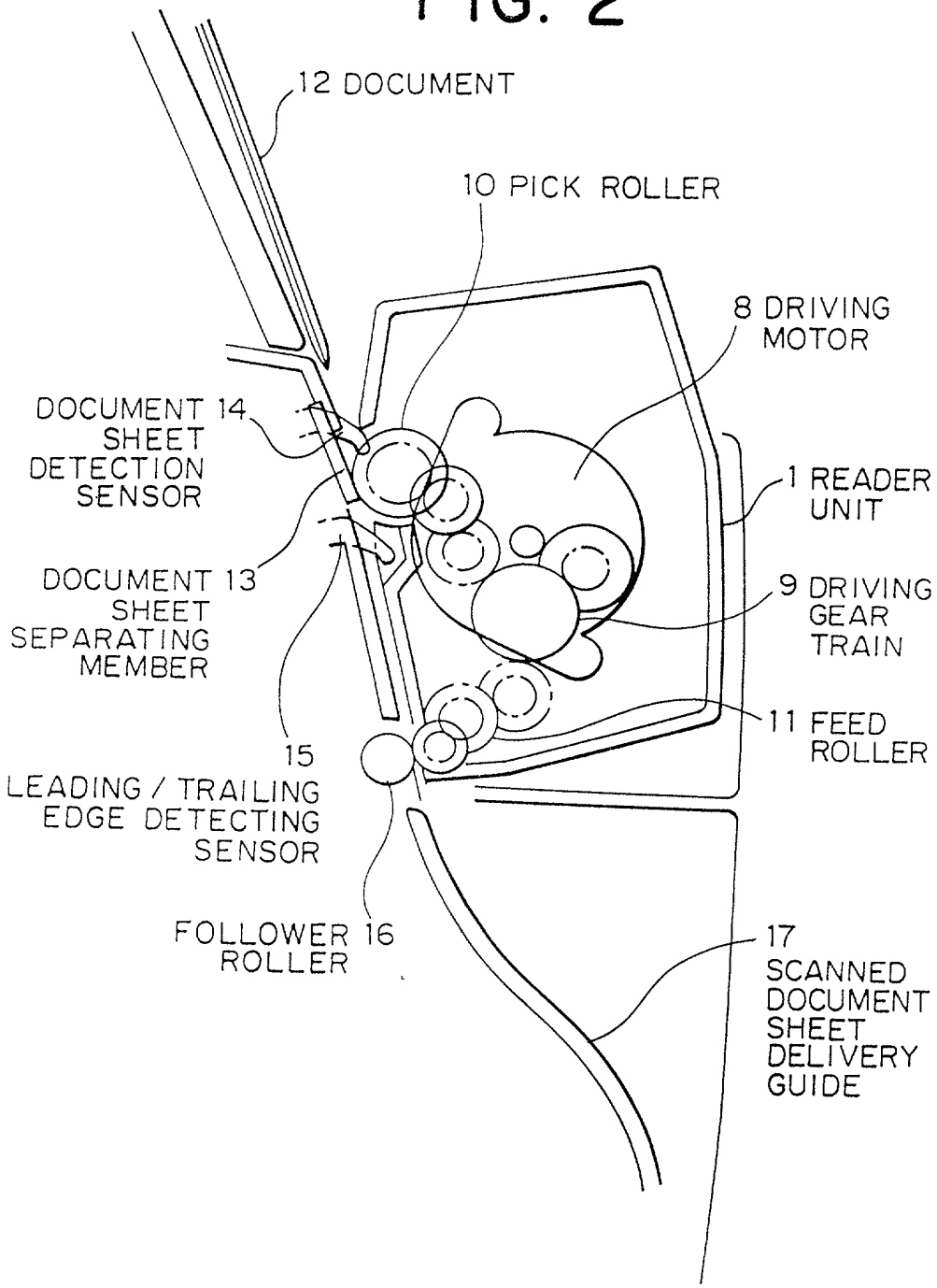


FIG. 3

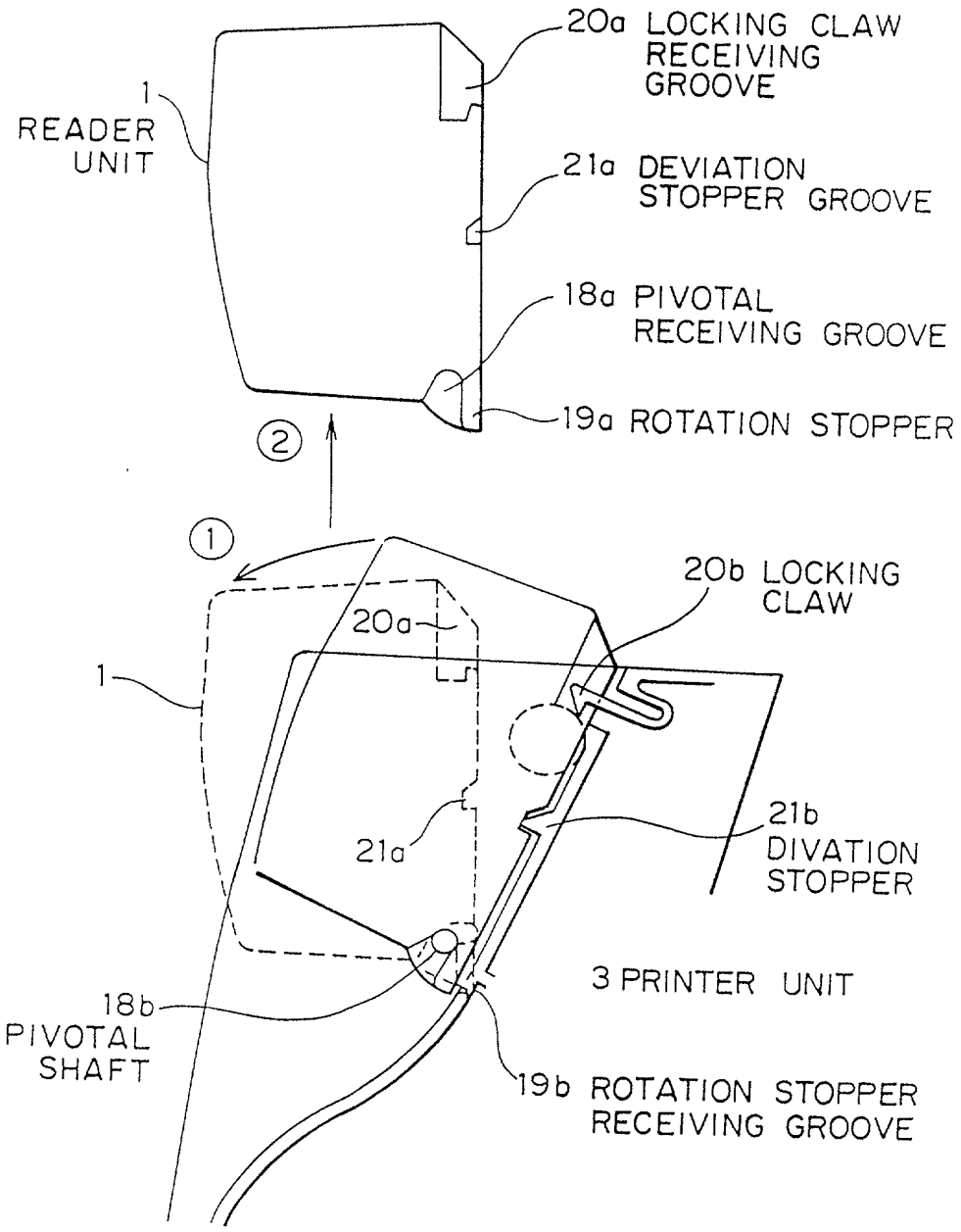

20a LOCKING CLAW RECEIVING GROOVE
1 READER UNIT
21a DEVIATION STOPPER GROOVE
18a PIVOTAL RECEIVING GROOVE
19a ROTATION STOPPER
②
①
20b LOCKING CLAW
20a
1
21a
21b DIVATION STOPPER
3 PRINTER UNIT
18b PIVOTAL SHAFT
19b ROTATION STOPPER RECEIVING GROOVE

FIG. 4

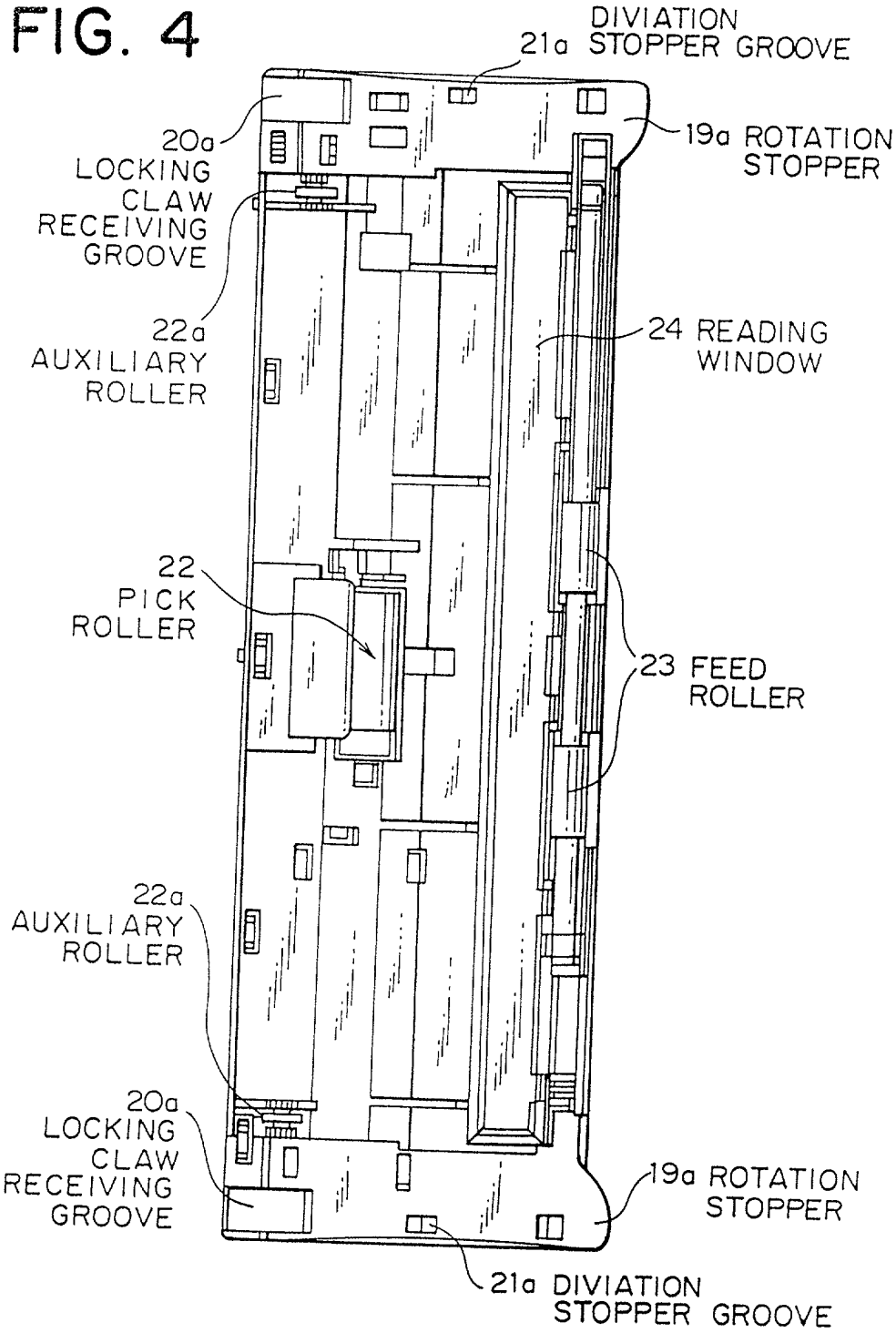

DIVIATION
21a STOPPER GROOVE
20a
LOCKING
CLAW
RECEIVING
GROOVE
19a ROTATION
STOPPER
22a
AUXILIARY
ROLLER
24 READING
WINDOW
22
PICK
ROLLER
23 FEED
ROLLER
22a
AUXILIARY
ROLLER
20a
LOCKING
CLAW
RECEIVING
GROOVE
19a ROTATION
STOPPER
21a DIVIATION
STOPPER GROOVE

FIG. 5

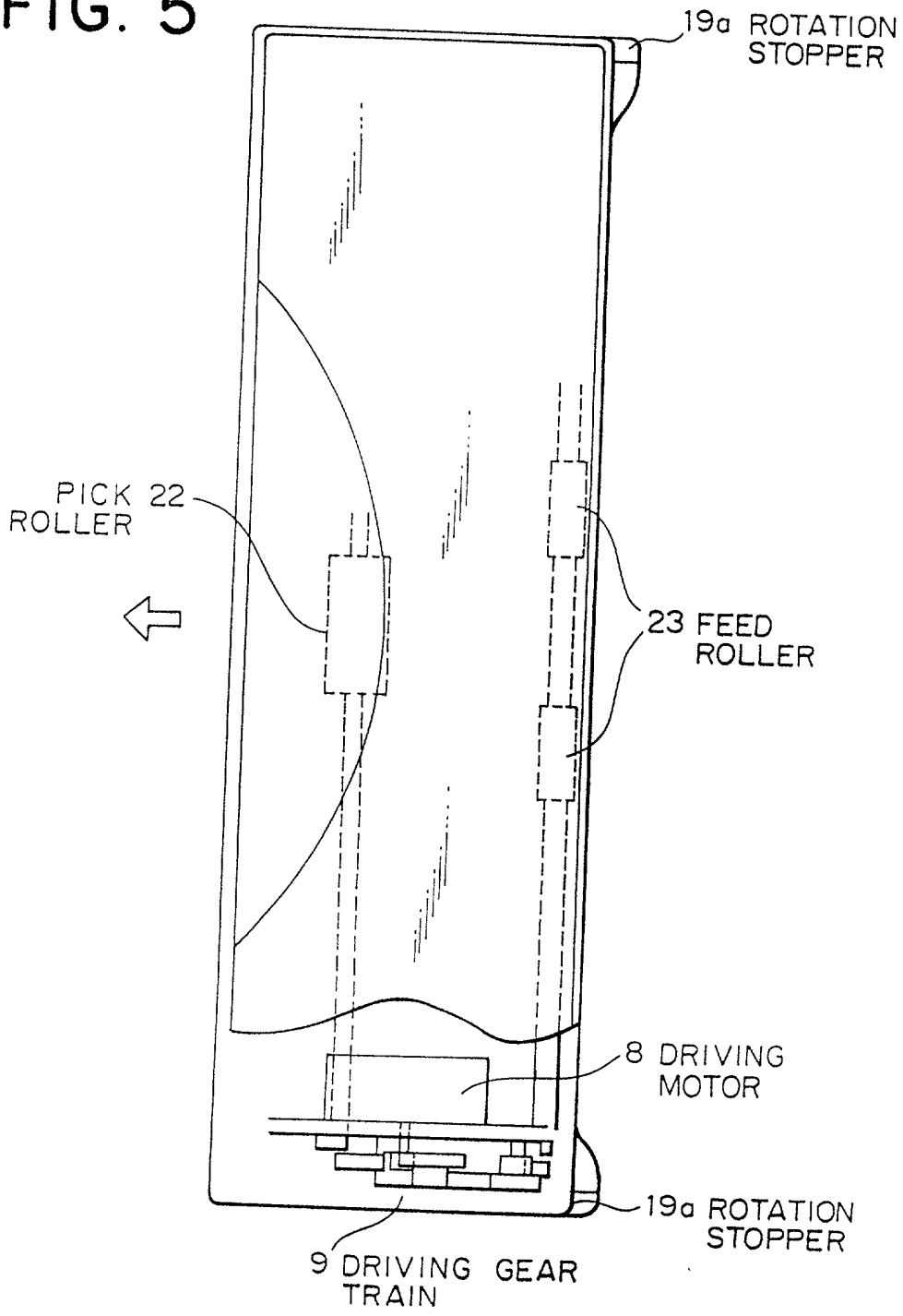

19a ROTATION STOPPER
PICK 22 ROLLER
23 FEED ROLLER
8 DRIVING MOTOR
19a ROTATION STOPPER
9 DRIVING GEAR TRAIN

FIG. 6

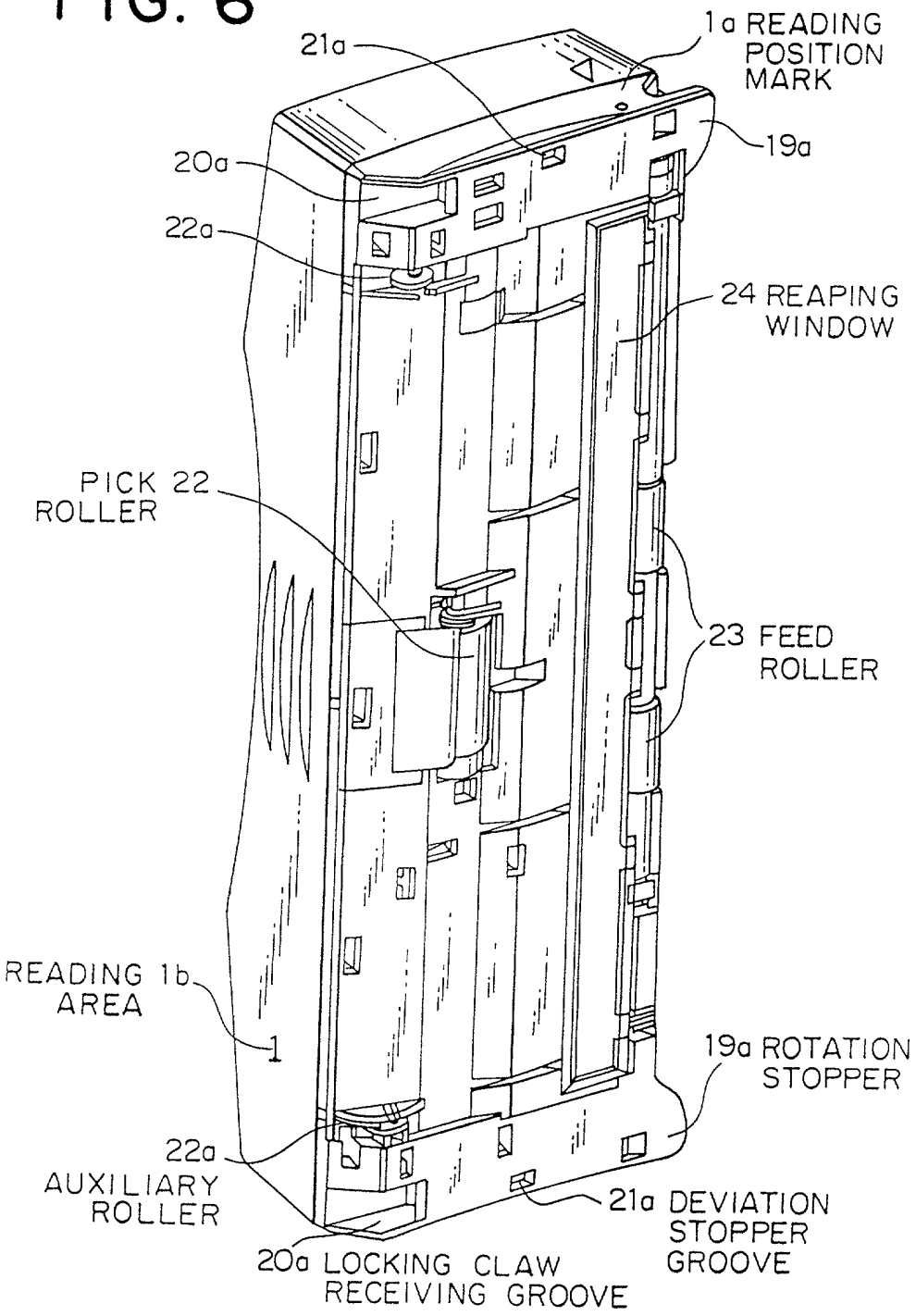

21a
1a READING POSITION MARK
19a
20a
22a
24 REAPING WINDOW
PICK 22 ROLLER
23 FEED ROLLER
READING 1b AREA
1
19a ROTATION STOPPER
22a AUXILIARY ROLLER
21a DEVIATION STOPPER GROOVE
20a LOCKING CLAW RECEIVING GROOVE

FIG. 6

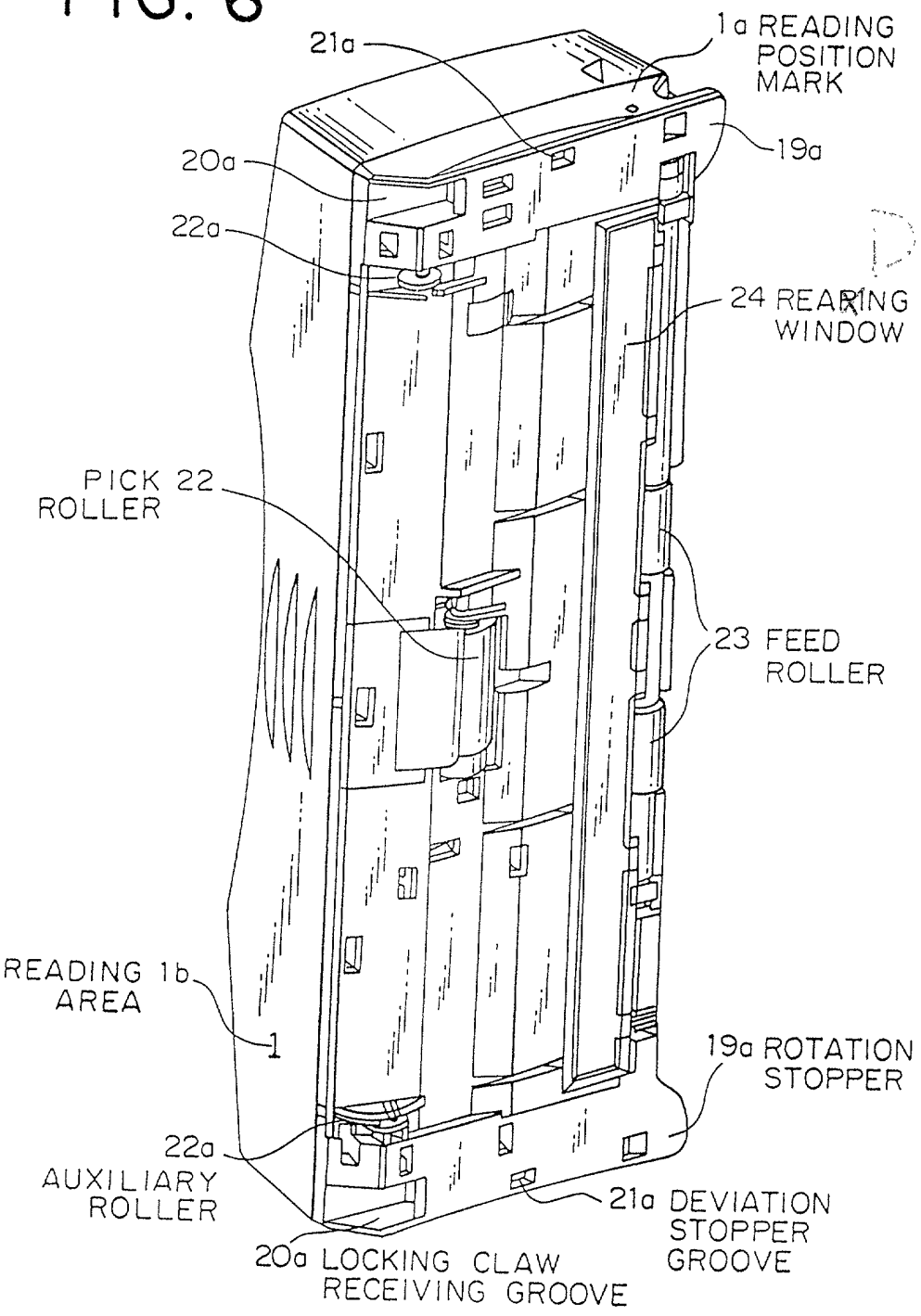

21a
1a READING POSITION MARK
19a
20a
22a
24 REARING WINDOW
PICK 22 ROLLER
23 FEED ROLLER
READING 1b AREA
1
19a ROTATION STOPPER
22a AUXILIARY ROLLER
21a DEVIATION STOPPER GROOVE
20a LOCKING CLAW RECEIVING GROOVE

FIG. 7

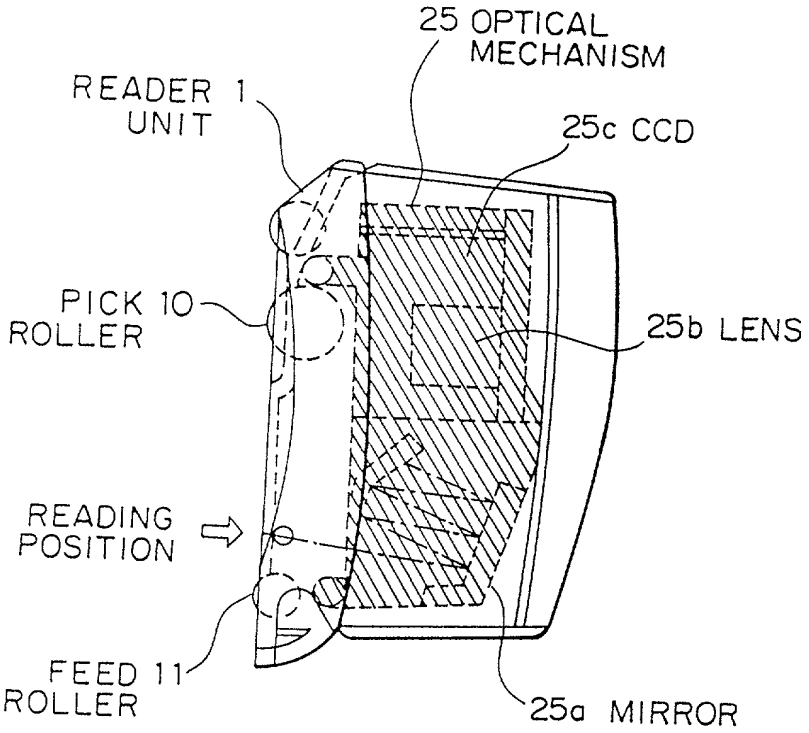
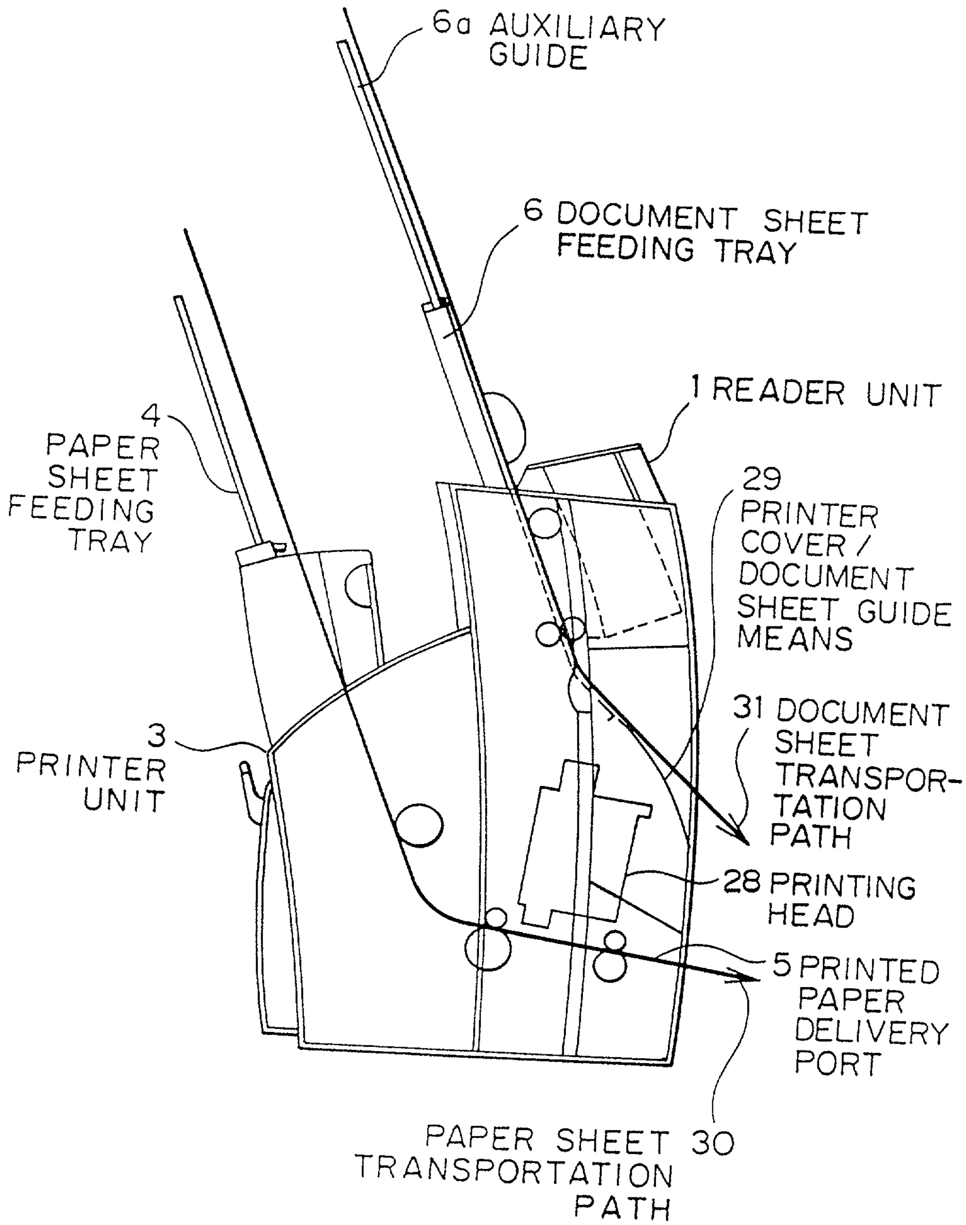
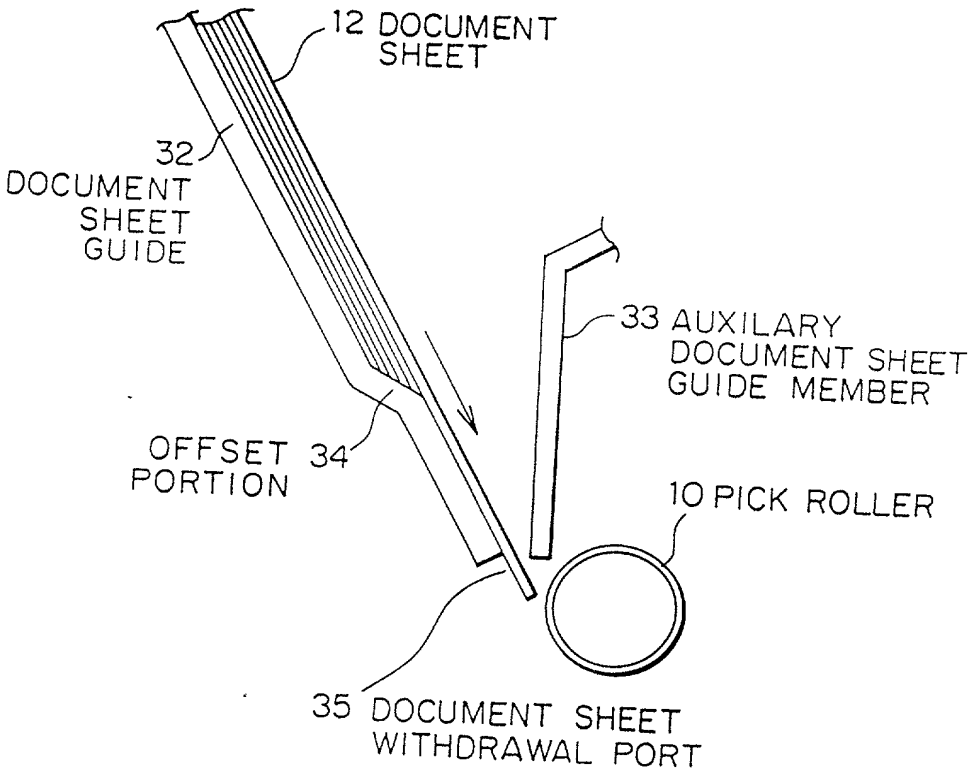

25 OPTICAL MECHANISM
READER 1 UNIT
25c CCD
PICK 10 ROLLER
25b LENS
READING POSITION
FEED 11 ROLLER
25a MIRROR

FIG. 8



6a AUXILIARY GUIDE
6 DOCUMENT SHEET FEEDING TRAY
1 READER UNIT
4 PAPER SHEET FEEDING TRAY
29 PRINTER COVER / DOCUMENT SHEET GUIDE MEANS
31 DOCUMENT SHEET TRANSPORTATION PATH
3 PRINTER UNIT
28 PRINTING HEAD
5 PRINTED PAPER DELIVERY PORT
PAPER SHEET 30 TRANSPORTATION PATH

FIG. 9


12 DOCUMENT SHEET
32 DOCUMENT SHEET GUIDE
33 AUXILARY DOCUMENT SHEET GUIDE MEMBER
OFFSET PORTION 34
10 PICK ROLLER
35 DOCUMENT SHEET WITHDRAWAL PORT

DECLARATION FOR PATENT APPLICATION

Docket No.56356

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: *APPARATUS EQUIPPED SCANNER UNIT*

the specification of which

(Check one) [X] is attached hereto.
[] was filed on as
Application Serial No .
and was amended on

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with Title 37, Code of Federal Regulations, 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)			Priority Claimed
292722/8	Japan	05/Nov./1996	YES
(Number)	(Country)	(Day/Month/Year filed)	

I hereby claim the benefit under Title 35, United States Code, 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code 112. I acknowledge the duty to

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(Application Serial No)	(Filing Date)	(Patented,Pending,Abandoned)

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith: **John J. McGlew, Reg. 17,722; and/or John James McGlew, Reg. 31,903; and/or Hilda S. McGlew Reg. 30,295; and/or Theobald Dengler, Reg. 34,575; and/or Clario Ceccon, Reg. 19,268; and/or Kristina M. Grasso Reg. 39,205.**

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of sole or first inventor Hitoshi TERASHIMA

→Inventor's signature Hitoshi Terashima →Date 1997.10.23
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Full name of forth inventor Tomohisa SANO

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Full name of seventh inventor Yoshiki TUCHIYAMA Y.T

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Full name of eighth inventor Satoshi KIRITA

→Inventor's signature Satoshi Kirita →Date 1997.10.23
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Full name of ninth inventor Hitoshi YOSHIO

→Inventor's signature Hitoshi Yoshio →Date 1997.10.23
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DECLARATION FOR PATENT APPLICATION

Docket No.56356

As a below named inventor, I hereby declare that:

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Full name of tenth inventor Terunobu OHUE

→Inventor's signature Terunobu Ohue →Date 1997.10.23
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56356 IA